

Sustainable Information Technology Group (SITG)

Thursday 18 February 2016, 3pm

Cuillin Room, Charles Stewart House

AGENDA

1	Minute To <u>approve</u> the minute of the previous meeting on 2 October 2015 and <u>raise</u> any matters arising	Α
2	Climate Strategy Review & ICT Contribution To <u>receive</u> an update from the Convener and <u>discuss</u> contribution from ICT	В
3	Energy & Utilities Programme Brief – Pathways to 10% To <u>receive</u> an update from the Convener	C
4	Sustainable IT Implementation Plan To <u>discuss</u> and <u>endorse</u> a paper from the SRS Engagement Manager	D
5	EAUC: Green ICT Update To <u>note</u> a paper from the Convener	E
6	ICT in the Context of Reuse To <u>receive</u> an update on the PC Reuse Project from the Chief Information Officer, CHSS	Verbal
7	IT Energy Footprint To <u>receive</u> an update from the Director of ITI	Verbal
8	Sustainable ICT Procurement & Supply Chains To <u>receive</u> an update from the Procurement Manager on the SPPT tool test and risks and opportunities in supply chains for ICT	Verbal
9	 Any Other Business To <u>consider</u> any other matters from Group members including: Student representation 	Verbal

UNIVERSITY OF EDINBURGH



MINUTE OF A MEETING of the Sustainable Information Technology Group held in the Elder Room, Old College on Friday 2 October 2015.

1 Welcome and Introductions

The Convener welcomed attendees to the first meeting of the Group which included representation from across the University, both physically and in terms of function.

The purpose of the relaunched Group was to generate discussion on possible action in terms of SRS and IT. It was noted that proposed membership had grown during the lengthy pre-meeting phase, and now needed to be reduced.

<u>Action – All</u> to give feedback through the Secretary on appropriate membership for the Group, including any additions and signalling if any areas were over-represented.

2 Membership, Remit & Governance Arrangements

The Convener introduced a paper on representation, scope and strategic oversight for the relaunched Group. The key element was the proposed remit in section 3 - in particular reaching an understanding of the footprint associated with IT and identifying opportunities to make energy, carbon and cost savings to contribute to review of the University's Climate Strategy.

Attendees noted that setting targets for consumption per area and reporting progress against these could be potentially burdensome, and that representation on the Group may not be at the right level to secure such reports.

Members discussed the prevalence of personal devices, agreeing to include in the Group's remit all University-owned devices, and noting that impact would vary by item (e.g. the conflict minerals issue was strongest in relation to mobile phones). As with the business aviation issue, the best approach would be to offer guidelines and opportunities for staff to test internally.

The Group broadly endorsed the paper, agreeing to rationalise membership.

Action – All to provide feedback on the remit via the Secretary.

3 Climate Strategy Review Update & ICT Contribution

In the absence of the Climate Policy Manager, the Convener outlined the context for this update on Phase 1 of the Climate Strategy Review. In terms of the current Climate Action Plan adopted in 2010, while the University had performed extremely well in some areas (such as waste, transport and CHP), emissions continued to rise. Efforts were underway to investigate what could be done, without constraining institutional growth and ambition. Evidence was being gathered on best practice around the world and a carbon modelling tool was being developed. The CIO for Humanities and Social Sciences noted a premade tool used elsewhere in the sector that could be used to get a clear idea of UoE's current position.

<u>Action – FM</u> to share further information on the tool.

The aim was to get a sense of the real scale of the University's IT footprint, as well as potential pathways for improvement. As a first step, members agreed that it would be helpful to establish a baseline to understand how significant in carbon terms the various issues were. Members acknowledged that the Group could identify useful changes while accepting that emissions in this area might still increase.

It was recognised that there had been a lack of rigour with regard to boundaries, though work was ongoing to resolve this. The key was operational control and deciding what this would mean in terms of IT. Historically, UoE had tended to take the entire hit for shared services such as ARCHER, and changing this to a calculated portion was one option. Attendees noted that boundary questions should not be allowed to get in the way of UoE's contribution to society.

<u>Action</u> – follow up with members on baseline and boundary issues linked to carbon footprinting.

4 Sustainable ICT Procurement & Supply Chains

The Procurement Manager presented for discussion a paper on the Sustainable Procurement Prioritisation Tool (SPPT), highlighting some of the broad SRS issues which relate to ICT supply chains, and outlining how potential risks are managed.

The Scottish Government Procurement Reform Bill would mandate additional sustainability requirements and changes in reporting. A dummy run using the SPPT had been carried out and the paper proposed a further SPPT exercise to set priorities for the coming years. This session may be held off until after December when the tool would be finalised. The CIO, Humanities and Social Sciences had attended the first SPPT session, found it to be useful, was happy to attend in future and encouraged others to do so.

It was essential to ensure procurement at UoE captured the overall power consumption of equipment, whole life costing etc. which were not necessarily part of current procurement requirements. Attendees proposed adding fair phones as an option for University telephony, which could help boost UoE's ranking in the People & Planet league.

<u>Action – GR</u> to reflect on attendees at the last SPPT session, what range to aim for at the next session, and put a request back to the Group.

No additional workshop- verbal update.

5 ICT in the Context of Reuse

The Chief Information Officer, CHSS presented an update on internal and external reuse, including recommendations on hard drive wiping, which had arisen through discussions within the College on PCs that were no longer required. The paper identified barriers to PC reuse (secure data erasure, storage and time constraints) and how they might be overcome to make the process less onerous and drive greater reuse. It was proposed that UoE investigate the use of a commercial product to cleanse PCs to a set standard.

Attendees noted potential risks of cascading internally kit that was more than 5 years old as it was likely to be the least energy efficient and could be cheaper to replace purely on running costs (though the energy involved in producing the piece of equipment should also be factored in). Further thought could be given to whether existing equipment could be made to serve for longer, potentially by upgrading components rather than machines. While there were positive examples of internal reuse saving resources, and members were keen to retain the option of cascading internally, it should be recognised that older kit required more support.

Members discussed selling equipment to staff for use at home. Some areas had taken payment for peripherals (though not desktop machines due to data protection issues) in order to be able to keep track of these through the system.

Equipment approaching end of life was of significant value to charities, and excellent partnership arrangements were already in place. These partnerships had very specific requirements which the Waste and Environment Manager had been working on.

С

<u>Action – MB</u> to share the protocols that had been developed in this area.

The Group expressed universal support for the idea of doing more in this space, though further debate on the principles and priorities was needed.

<u>Action – FM</u> to reflect further on the key issues and a potential starting point, and report back to the Group following further discussion.

6 Conflict Minerals Policy

In the absence of the Research & Policy Manager, the Head of SRS Programmes presented this paper providing background on the development of a conflict minerals policy for the University and offering a draft of the policy to consider and potentially endorse.

SITG noted that the Chief Information Officer and Librarian to the University was broadly supportive of the policy, suggesting it be adopted and reviewed within the year. The intention was to start at the collective buying level, rather than focus on individual equipment. The issue highlighted deep implications within UoE supply chains. These issues generally began as voluntary before becoming mandatory. It was essential for the University to remain ahead of the curve and signal its position for the companies it does business with (though most companies UoE sources from have their own conflict minerals policies).

SITG members endorsed the draft policy. Once consultation was finalised it would be submitted to IT Committee and SRS Committee for approval.

7 2015-18 Framework Planning Exercise

The purpose of this facilitated planning exercise was to gather initial thoughts on SRS opportunities within ICT and where the Group was going to develop into an action plan.

Group 1 identified two main priorities: power efficiency and the circular economy. Developing a broad understanding of the University's IT footprint should be the first step. A review carried out last year found that half the spend associated with IT sits with Information Services and is centrally managed, the other half is distributed and devolved. Once a baseline was established the Group would be in a position to identify efficiencies. If included the Advanced Computing Facility (ACF) would dominate power use figures. The Group was advised not to look to ARCHER for further efficiency savings. These facilities delivered the ability to model, saving energy by running experiments digitally through simulations.

Group 2 focused on the baseline, data availability, and annual audits. Wireless could be used to map and monitor device usage levels. Guidance should be made available including information on the relative impacts of different pieces of equipment to drive positive behaviours. Devolving data and systems budgets could make a difference. SITG could promote a shift to paperless working and increase messaging on positive impacts.

Group 3 discussed the need for an energy consumption tracking tool to collate and analyse data, noting the JISC-funded IT Higher Education Energy Consumption Tool. SITG could look into intelligent power consumption agent software which could generate significant savings. An energy standby policy could be implemented for supported desktops. SITG could promote the introduction of other procurement options (e.g. fair phones as part of the telephony options on the procurement website). It was recommended that the Group seek a student representative.

Action – MB & CO to prepare a summary for circulation with the minutes.

<u>Action – All</u> to send any suggestions for a student member to the Secretary.

Action – JR to schedule quarterly meetings starting in January 2016.



Sustainable Information Technology Group (SITG)

Thursday 18 February 2016

Climate Strategy Update

Description of paper

This paper provides an update on Lots 1, 2 and 3 of the technical consultancy work supporting review of the University's Climate Strategy.

Action requested

SITG is invited to note the paper and discuss contribution from ICT.

Background and context

As part of the new Climate Strategy for the University currently under development, external consultants were appointed to undertake three lots of work:

- 1. development of a carbon modelling and scenarios tool
- 2. review of carbon management best practice in the sector along with recommendations
- 3. development of business cases to support investment in renewables, micro-renewables and energy reduction.

Discussion

Technical Consultancy Support

Progress Report

To assist with its Climate Strategy Review the University of Edinburgh appointed consultants to deliver the following three projects; develop a carbon modelling and scenarios tool, undertake a review of carbon management best practice in the University sector and provide subsequent recommendations to the University of Edinburgh and the wider sector in Scotland, develop business cases to support investment in renewables, micro-renewables and energy reduction.

The Scottish Funding Council (SFC) has provided funding to assist the sector in taking forward its climate change strategies, and the outputs from the technical consultancy support will be shared with the wider Scottish sector.

The carbon modelling and scenarios tool requires further data and development for the University's purposes. The review of carbon management best practice has been completed and a final report is due shortly. The development of business cases project has been completed and a final report has been received.

Carbon modelling and scenarios tool Aether UK

The process for developing the tool has been beneficial in developing calculations to project and forecast future carbon emissions. Further work is required to develop the tool for the University's purposes however the tool will be of value to the sector going forwards (especially for those institutions without CHP). The tool currently reports carbon emissions against campus sites – this would need to be altered to meet the specifications of each institution.

The carbon modelling and scenarios tool has been designed to be used as the central hub for collecting data related to energy use in buildings, from transport, water consumption and waste generation and will compile and calculate resulting carbon emissions. The tool will act as the repository for the historical time series dating back to the University's baseline year 2007/08, and provide insight into potential future emissions based on the trends in historical consumption, on carbon saving projects and potential changes to the university's operations (e.g. floor area and student population). Functionally, the tool has taken the form of an excel workbook providing the data repository and calculation mechanism, which generates a number of scenarios through an online dashboard.

The tool has been developed further based on feedback from University stakeholders, however further work is required to ensure it produces accurate and robust projections and forecasts. Further energy data is required to ensure the carbon assessment generated by the tool for 2013/14 is close to the figures reported by the University. Ensuring emissions from the University's Combined Heat and Power (CHP) Energy Centres and Networks are accurately represented within the tool continues to be a challenge.

Review of carbon management best practice

Best practice identified through the research will be shared with the wider Scottish sector and will complement research previously carried out by the EAUC/SAUDE and the Sierra Club. Feedback on a draft report has been provided by University stakeholders, with an updated report due week commencing the 11th January.

The report on best practice in carbon management in the University sector is based on research into practices at UK universities, considering first Russell Group universities, and some exemplar universities internationally. A questionnaire was developed and thirty two institutions were contacted. In the report a total of twenty institutions were included through interviews, completed questionnaires and desk based research.

Universities were asked to provide information on carbon targets and metrics target setting processes and decision tools, governance and reporting, financial assessments and rules, key actions, innovative approaches, green revolving or sustainable projects funds, behavioural change initiatives and communications, approaches to energy provision and use, micro renewable usage and incentivisation, accounting for energy, travel and waste, laboratories design and management, building design including laboratories and research areas, capital programmes, green IT, space management and off-site renewable energy production.

The report includes summaries of the Scottish universities carbon management performance review undertaken by EAUC/SAUDE and the Sierra's Club report on 'America's Greenest Universities'.

Developing business cases

A final report with templates for business cases has been provided to the University, and will be of great benefit to the University's Climate Strategy Review. The research into renewables, micro-renewables and energy reduction measures will be of benefit to the wider Scottish sector. The business case templates can be adapted and used by institutions. A meeting to close the project will be arranged for February.

The project included the following work;

- 1. Development of business case information and presentation (this evolved to providing a carbon assessment spreadsheet for the business case template developed in conjunction with the University's Finance Department)
- 2. Technology assessment a list of technologies was developed and input gathered from stakeholders on what could be suitable for the University, with high level assessments carried out to identify benefits where possible,
- 3. An investigation into potential technology funding options input was gathered from the Finance Department and external funders including the Green Investment Bank and Scottish Equity Partners to build an understanding of how projects could be funded
- 4. The provision of example business cases business cases were provided using the carbon assessment spreadsheet, with supporting information in this report.

Additional research was completed to provide a better understanding of the decarbonisation of the electricity grid, levelised costs for future energy generation and offsetting through land carbon sequestration.

Resource implications

No direct resource implications. Primary resources for the review come from the SRS Department, supported by Estates.

Risk Management

Key risks for Climate Change Strategy development include: project deadline drift; failure to delivery consultancy work on time/to satisfaction; failure to agree new targets and KPIs; failure to align with core strategic processes; failure to deliver work stream proposals on time/to satisfaction; and lack of awareness, support or buy in from the University community and senior managers during strategy development, and/or once strategy completed. Strategies are in place to manage and mitigate these risks including use of a project management approach, stakeholder workshops and dialogue, and discussions with GaSP on the new strategic plan.

Equality & Diversity

Due consideration has been given to equality and diversity as a key element of the SRS agenda. An Equality Impact Assessment is not required.

Next steps/implications

SITG will continue to receive updates as the review progresses through to spring 2016.

Further information

Author: Matthew Lawson, Programmes Manager Presenter: Dave Gorman, Director of SRS.

Freedom of Information This is an open paper.



THE UNIVERSITY of EDINBURGH

Sustainable Information Technology Group (SITG)

Thursday 18 February 2016

Utilities Programme Brief

Description of paper

The purpose of this paper is to outline the scope and shape of the programme of work and next steps towards achieving a 10 percent reduction from business as usual during 2015-2017 from a 2014-15 baseline. Annex A provides the objectives, scope, assumptions, and next steps.

Action requested

SITG is asked to note and comment on the paper.

Resource implications

The programme has been developed based on current staffing assumptions but is dependent upon the University investing in 'spending to save'. Hence roll out of activities should go hand in hand with a proposed Sustainable Campus Fund or similar mechanism.

Risk Management

See attached.

Equality & Diversity

Although due consideration has been given to equality and diversity as a key element of the SRS agenda and we do not currently think that an Equality Impact Assessment is required, we will continue to monitor issues within our work.

Next steps/implications

- Comment on Programme Objectives and Scope at SOAG meeting in January 2016 for sign off by Director of CSG with Director of SRS and Director of Estates (SOAG) and SRS Committee in February
- 2. Confirm funding mechanisms for sustainable campus fund
- 3. Continue to further develop and roll out communications and engagement (SRS)
- 4. Further develop compilation of projects
 - a. Labs in progress working through Sustainable Laboratories Steering Group
 - b. Large building projects in progress (Estates)
 - c. Small projects via energy coordinators (Spring 2016) (SRS)
- 5. Analysis of triad / store / demand opportunities (Estates)

Consultation

This paper has been developed as an output of the Utilities Working Group including representatives from Estates, SRS and (more recently) Accommodation Services.

Further information

Presenter Dave Gorman, Director of SRS

Freedom of Information This paper may be included in open business.

University of Edinburgh:

Utilities Working Group ProgrammeBrief:Pathways to Energy Savings

Version

Version	Date	Description	Author
1.0	October 15	First version to Utilities Working Group on 8 th October for discussion and endorsement.	Dave Gorman, Jane Rooney & Michelle Brown
2.0	December 15 January 15	Final Draft incorporating comments from Working Group Members. To be circulated back to members and final review at SOAG in January 2015.	Dave Gorman, Jane Rooney & Michelle Brown

Approval

Approvers	Role	Signed	Approval Date – TBC
Director of	Senior		January 2016 target
Corporate Services	Programme		
Group	Sponsor		
Director of Estates Programme			January 2016 target
	Sponsor		
Director of SRS Programme			January 2016 target
	Sponsor		

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1. Programme Purpose

Estates and the Department for Social Responsibility and Sustainability (SRS) have been tasked with developing a programme to identify and implement savings to University energy use with the following goal:

• to achieve a 10 percent reduction from business as usual during 2015-2017 from a 2014-15 baseline

Despite progress made through investment in energy infrastructure (in particular Combined Heat and Power), and other efficiency measures as well as behaviour change programmes, the costs of utilities are soaring and the University is not on track to achieve its current carbon reduction targets.

Based on preliminary analysis of the cost of utilities to the University over the last 10 years (2004/5 to 2014/5), it appears that costs have increased at roughly 15 percent per annum (from £5.3M in 2004/5 to £20M in 2014/15). Following these projections, in 2 years, utilities would be estimated anywhere from £21.2 to £27.4M and by 2025 £25M to £40M. The wide range in different forecasts is based on which scenario is used with the lower scenario aligned with UK industry averages and the higher scenario based on an average of the previous 10 years. Figure 1 (below) shows these wide variances. Figure 2 shows actual and potential energy consumption (kWh) as per Energy Office data during the same time (primarily electricity and natural gas).

Figure 1: Energy Costs at the University of Edinburgh.



Figure 2: Energy Use at the University of Edinburgh



Unlocking savings from utilities (consumption, financial or carbon) will require a joined up approach taking into consideration: building design and refurbishment; energy monitoring and reporting infrastructure; specific issues within laboratories; promoting positive policies and behaviour change; ensuring incentives are in place for managers and administrators; identifying technical initiatives for energy supply and unlocking funding mechanisms to drive local buy in. Ramping up efforts to be more efficient with energy use can help to reduce

electricity demand, tackle rising energy costs and meet carbon targets.

In 2015 a Utilities Working Group was established as a sub-group of the Sustainable Operations Advisory Group (SOAG) with Director of SRS and Assistant Director Estates Operations as co-chairs. This programme

brief has been developed as an output of the group to define the target, identify potential pathways and outline responsibilities, actions, risks and governance arrangements.

2. Definition and Scope

Programme Objective: The programme aims to **identify** and **implement** the savings which would achieve a 10 percent reduction from business as usual during 2015-2017 calculated from a 2014-15 baseline.

Baseline: 2014-15 will be used as a baseline with the target covering 15-16 and 16-17.

Targets:

- **Financial:** As the utilities spend was £16,900,000 for academic year 2014/15¹, the target will be to identify savings of roughly **£1.7 Million by 2016/17.** A projected spend for 2016/17 is estimated at approximately £21-27 Million.
- Energy Use: As the utilities usage was approx. 290,000,000 kWh for academic year 2014/15 the target will be to identify savings equivalent to **29 Million kWh by 2016/17**. If we estimate that actual energy use increases by 1 percent per annum then projected energy use for 2016/17 would be approximately 296,000,000 kWh.
- **Carbon:** The Climate Strategy / Action plan will be setting out future targets for CO2 emissions. The Climate Action Plan 2010 proposed a reduction in University carbon emissions of 29% by 2020, with an interim target of 20% by 2015, against a 2007 baseline. Future carbon targets to be confirmed as part of the climate strategy work.

Each year of the programme should therefore look to identify roughly £1M of savings or approximately 15M kWh adding up to £1.7M or 29M kWh at the end of the programme in year 2.

The current scope includes all University activities including accommodation services but excluding developments with no overall control (e.g. Holyrood development).

Note: It has been debated if ACF should be included within the project scope and that the (approx.) £2.5 M paid in utilities (14/15 estimate) for ACF should be excluded from calculations. However, for the time being the targets have not been adjusted to reflect this.

3. Assumptions

- The target is to be achieved from a bottom up compilation of individual projects that together make up the cumulative target.
- That the University invests in 'spending to save' and will approve a Sustainable Campus Fund as well as additional mechanism to allow for this².
- The target would be from a fixed baseline and expressed as percentage saving from business as usual and is separate from any growth in university and changes in prices.
- Quantifying savings will require estimates based on rules of thumb or industry best practice where metering data is not available.
- Targets are based against a base year and changes to energy prices are not part of the programme scope.
- Some increase in Estates capacity to manage the increased flow of spend to save projects is likely to be required but that SRS staffing is sufficient to deliver on labs and communications / engagement elements.
- Other stakeholders will be able to devote appropriate staff time and the financial resources necessary to conduct the programme and projects.
- That both SRS and Estates have a shared objective to deliver 10 percent savings but support from across all parts of the University is required to secure success.

¹ Annual Report and Accounts 2014/15

² Currently proposed Sustainable Campus Fund is £2.75M. Assuming optimistic average of a 4 year payback period (25% ROI) we would need to spend £8M to achieve £2M savings

4. Programme Approach

Preliminary work-streams identified included: 1) data, feedback and incentives; 2) new developments and standards; 3) technical solutions; 4) awareness and promoting positive behaviours; and 5) novel energy solutions and technologies which has helped to frame the programme approach and identify dependencies. Estates is currently undertaking a utilities metering, monitoring and targeting and reporting systems review (see project scope document August 2015) which this programme will need to link with.

Based on opportunities identified through the Utilities Working group the following programme elements will make up the programme approach:

Pathways to Savings

- I. Large Scale Building Projects (Estates)
- II. Energy Communications & Engagement (SRS w Estates)
- III. Local small scale energy savings and initiatives (SRS and Estates)
- IV. Laboratories (SRS and Estates)
- V. Triad / Store / Demand Management Processes (Estates)
- VI. IT (SRS and IS and Estates)

Savings identified would need to make up the 'Pathways to £1.7 Million' in energy savings. This would require investment and hence the Sustainable Campus Fund (Green Revolving Fund?) would be a key component of this programme

4.1 Pathways to Savings

The table below illustrates potential pathways to financial savings of £1.7M within two years. Various options have been discussed as part of the Utilities Working Group and further analysis will require more detailed reviews with specific locations and schools. Further analysis to look at the energy and carbon savings would be required and could be reviewed via the Sustainable Campus Fund or a similar mechanism.

Table 1: Indicative Pathways to Financial Savings ³

		Potential	Potential	Total Potential	Total Potential		
		Projects	Projects	£ Savings	KWH Savings		
	Potential Pathways	Identified for	Identified for			Lead	
		Vear 1	Vear 2	Vear 1 + Vear 2	Vear 1 + Vear 2		Notes (see main body text for more details)
		Teari	Teal 2	Teal 1 Teal 2	Tear 1 Tear 2		
	Lorge Building Projects Investments (i.e. Libron)						14/15 projects estimated savings of 100k. If
	carge Building Projects Investments (i.e. Library	£200,000	£300,000	£500,000	tbc		further investment assuming this could be
1	of other large scale systems change)					Estates	ramped up.
							Assumption based on previous work. Difficult
11	Energy Communications & Engagement (SWITCH) an	£50,000	£100,000	£150,000	tbC	SRS (with Estate	to measure and show attribution.
							Risk of overlap in estimates between small and
ш	Local Small Scale Energy Savings Investments (i.e. no	£139,000	£150,000	£289,000	tbc	SRS (with Estate	local and large building projects
							See 2-5 Year Forecase to Labs Steering Group.
	Laboratories Investments (freezers, fume	£100.000	£100.000	£200.000	thc		Only potential. No Funding Confirmed. Some
	cupords, LED, timers, etc)	100,000	1100,000	1200,000	ibe		overlap with large scale projects below.
IV						SRS (with Estate	Approx 20k coved already. Detential for
							Approx Sok saved arready. Potential for
	Triad Management	£10,000	£20,000	£30,000	tbc		additional 10k? Guessing at numbers. DB to
v						Estates	advise
VI	IT		£100,000	£100,000	tbc	SRS/IS/Estates	
	Running total	£499,000	£770,000	£1,269,000			Cannot be achieved without investing.
							Sustainable Campus Fund would draw further
	Indicative Gap			£431,000			projects out. Would need to ensure capacity to
							implement.

Rationale:

Large Buildings: An assumption has been made that one or two major buildings can be intensively tackled to deliver substantial savings of £200-250k each year. This is based on the work put forward in the first meeting of the Utilities Working Group. In 2014/15 Energy Conservation Projects within estates equated to potential savings of £95,000 per annum. These included: demand based ventilation in Main Library (estimated savings of £66k per annum); chilled water systems changes in JCMB (estimated savings of £35k per annum); heating modifications to circuits in CSE (estimated savings of £48k per annum); adjustments to speed heating and

³ Projects and savings estimates to be confirmed

cooling pumps at QMRI (estimated savings of £18k per annum); and hot water systems improvements in Paterson's Land (estimated savings of £13K per annum). These projects are currently in the feasibility or pipeline stage and Estates is currently looking at prioritised projects for 15/16.

Awareness and Promoting Positive Behaviours - Energy Communications and Employee Engagement:

In 2006, the University of Edinburgh launched a Switch & Save campaign. This was complemented by face-toface engagement (via a team now embedded within SRS) at various buildings and departments. Based on analysis from 2013, this local engagement was estimated to save £80k in energy costs. Lessons learned from previous engagement at UoE and elsewhere have pointed to the need for: availability of data so that individual buildings/departments/schools are able to see and understand a measurable change; alignment with local building context (feedback from staff that they are too hot/too cold /unable to influence their local situation) as well as incentives and recognition. The Edinburgh Sustainability Awards, the Be Sustainable Series and other programme offerings of the SRS Department also engage employees on energy / carbon savings. Given that schools do not pay for their own energy costs, there are perceived lack of incentives for energy savings.

Organisations such as Carbon Trust estimate that an investment of between 1-2% of energy spend in an effective employee engagement campaign, could enable organisations to save up to 10% on energy costs with the right institutional mechanisms in place.

For this Programme, communications and engagement campaigns have been estimated to save a modest £50k in year one, and £100k in year 2. SRS has worked with Estates to review objectives and activities and ensuring data is in place to facilitate engagement. A key element of this programme is to work with and support the network of Energy Coordinators across the University. It should be noted that it is difficult to measure the impact from awareness raising activities and lessons learned from previous projects has identified that measures need to be in place to fund projects identified by local coordinators together with colleagues from Estates. In spring 2016 location specific engagement reviews (including energy audits) will take place to engage in depth with employees and identify further potential savings across 17 locations.

Local Energy Savings Projects: Based on rudimentary analysis it is estimated that approx. £150k savings in small projects could be identified. Lighting improvements, heating and cooling settings optimisation, and infrastructure upgrades, among other projects, could achieve savings across target locations. For example, the Energy Coordinator at the Informatics Forum has identified *potential to save up to an estimated 480kWh/day (ca. 9% of electricity consumption) by rationalising the use of Uninterrupted Power Supply (UPS) equipment.* However, until the Energy Audits are carried out we would not be able to provide further estimates.

Laboratories: Based on a review of opportunities for efficiency improvements in laboratories, an original programme was developed which was reviewed with the Sustainable Labs Steering Group in 2015. Total annual cost savings were estimated to be approximately £100k per year with an opportunity for a 5 year *cumulative* savings estimated to reach nearly £3.4M. This would include proposals such as: replacing old ULT freezers with new ones; rationalisation of sample storage (to enable some freezers to be emptied and switched off); replacing fume cupboards (with VAV or low flow); motion sensor controls or lighting; fitting timer plugs; replacing inefficient equipment; demand based ventilation; incorporation of natural ventilation and adjustments to freezer temperatures. Given the nature of these projects (linked to behaviour change and communications and engagement) some could be led and implemented by SRS with the appropriate building / lab users while other projects would require alignment with estates building plans. Hence there is a risk of overlap with the large building projects noted above as well as labs behaviour change campaigns.

Triad Management: Identifying times to reduce electricity usage during the triad periods could potentially provide significant savings on purchased electricity⁴. Investing in energy storage and onsite energy generation (and in particular renewables) could also help to substantially control future costs.

⁴ From November to February - National Grid monitors the system to identify the three half-hour periods when national demand for electricity peaks. The three highest periods are known as "Triads" and at these times large power users'

Sustainable IT: Following sign off on the remit, a Sustainable IT Group is now being established and may well identify savings over time. To reflect the fact that the group is only just being established, zero savings are proposed in y 1 but a notional £100k in year 2. However, savings may tie in with other categories above.

4.2 Investing in Savings

There are clear opportunities for investments into energy efficiency projects throughout the University. However due to a lack of effective drivers these opportunities are not currently being properly identified and secured. This may change over time as a result of the transparent accounting and RAM projects.

A joint bid between Estates and SRS Department is proposed for a 5 year Sustainable Campus Fund. Commencing in 2016-17 this would make available additional funding for energy and sustainability projects across the University on a spend to save basis. Staff costs associated with the design, delivery and review of the Fund would be absorbed by CSG.

It is proposed that the fund be managed jointly by Estates and SRS staff on a project by project basis, with applications sought across the University for projects to identify, capture and deliver energy efficiency and energy and carbon reduction in support of the 10% energy reduction target. Reviews of best practice from elsewhere such as Stanford, Harvard and Cambridge Universities, combined with discussions with colleagues managing buildings, laboratories and catering, suggest there are cost-effective spend-to-save opportunities and paybacks of less than 5 years. The fund would be established with clear criteria to be met including cost savings, carbon reduction, return on investment and simple payback and would build on best practice identified elsewhere. An important component would be potential savings identified within laboratories. Evidence gathered from Harvard, Stanford and Cambridge Universities suggest such mechanisms can deliver real improvements in staff engagement on these issues beyond the immediate sums saved.

It is proposed that the fund be established on a pilot basis in 2016/17 and reviewed after its first year for success in delivering cost and energy/carbon savings. The proposed profile of spend over the next 3 years is £0.75m in 2016/17 rising to £1m in 2017/18 and 2018/19. This will be reviewed by Estates Committee in 2016.

5. Deliverables

- Development of Sustainable Campus Fund mechanism subject to corporate agreement to finance projects
- Compilation and subsequent delivery of individual projects that together make up the year 1 and year 2 targets.
- Increased awareness of, and support for the need to manage energy for efficiency and sustainability reasons, and positive changes in awareness and behaviour
- An audit of performance and delivery of targets in 2017 and review of lessons learned.

6. Dependencies

- Unlocking funding to 'Spend to Save' via Sustainable Campus Fund or similar mechanism
- Developed and implemented proposals for improvements to energy monitoring, metering and reporting at increased accuracy and granularity
- Data availability to understand specific location baseline and potential and actual savings
- Incentives for Schools and Integrated Accounting:
- Potential need for increased Estates capacity to deliver new flow of projects
- Sustainable IT group agrees and delivers savings

transmission system charges are based on their demand. Triad demand tariffs forecast for 2015/16 Southern Scotland £22.25/kwh.

7. Approvals

• The Director of Corporate Services Group, the Director of Estates and the Director of SRS will need to collectively approve this Programme Plan with additional agreement sign off for the Sustainable Campus Fund.

8. Roles and Responsibilities

- Governance: SOAG
- Coordination: Utilities Working Group
- Executive Sponsor / Sign off: Director of Corporate Services Group, Director of Estates, Director of Social Responsibility & Sustainability
- Programme Management:
 - Work-streams / Sub-Programmes
 - Large Scale Building Projects (Estates)
 - Energy Communications & Engagement (SRS and Estates)
 - Local small scale energy savings and initiatives (SRS and Estates)
 - Laboratories (SRS and Estates)
 - Triad / Store / Demand Management Processes (Estates)
 - IT (SRS and IS and Estates)

Following SOAG meeting in January 2016, it is proposed that a tightly focused Utilities Working Group meet monthly with rotating chair between SRS and Estates.

9. Programme Control

SRS and Estates would need to work closely to ensure deliverables.

- Sub-Programme Status and RAG reports via Utilities Working Group
- Issues log(s) via Utilities Working Group
- Risk log(s) via Utilities Working Groups

More details on each of these to be provided.

10. Programme Timelines

Detailed programme and sub-programme timelines to be worked up. The current assumption is that this will fall into the following phases:

Phase I	Phase II	Phase III
2015-2016	2016-2017	Summer/autumn 2017
 Initiation and agreement of brief Identify potential pathways to £1M and £2M Seek agreement on campus fund proposals data project Initial projects Deliverables descriptions 	 Commence delivery, Record progress, learn and refine pathways 	 Close down and next steps Audit of delivery of targets and lessons learned

11. Next Steps

- 1. Approve Programme Objectives and Scope at SOAG meeting in January 2016 for sign off by Director of CSG with Director of SRS and Director of Estates (SOAG)
- 2. Confirm funding mechanisms for sustainable campus fund (DG/HE/GJ/PM)
- 3. Continue to further develop and roll out communications and engagement (SRS)
- 4. Further develop compilation of projects
 - a. Labs in progress as per SLSG paper (AA)
 - b. Large building projects in progress (RC/DB/DJ)
 - c. Small projects via energy coordinators (Spring 2016) (CO)
- 5. Analysis of triad / store / demand opportunities (DB)

12. Governance

Programme oversight and governance arrangements for the project will be via the Utilities Working Group to the Sustainability Operations Advisory Group.

13. Risk Management

There are recognised and significant financial risks as well as reputational risks for the University in terms of the costs of utilities. There are numerous risks (linked to the dependencies) for this programme and mitigation strategies will need further development. A detailed risk register to be reviewed within Utilities Working Group.

Risk	Probability	Impact	Proposed Mitigation (to be reviewed)
Campus Fund not agreed or funded. Programme depends on spend to save investment.	Possible	Major	 Director of SRS, Director of Estates and Director of Corporate Services Group to take proposal to Estates Committee.
Delivery within 2 year deadline. Currently halfway through year 1 with only partial pipeline of identified projects. Current gap of approx. 400k in pipeline of potential savings	Possible	Major	 Prioritisation of objectives has already taken place with this being a key area for SRS in coming year. Early programme stage requires significant amount of time from energy office for data analysis. Sustainable Campus Fund to draw further projects into pipeline.
Pipeline of projects does not come forward	Possible	Moderate	 Sustainable Campus Fund to draw further projects into pipeline.
Capacity to deliver. Risk that those responsible for programme delivery will have competing priorities or lack of capacity in teams.	Possible	Major	 Programme management approach to clarify goals, objectives, roles and responsibilities in progress. Placement of project coordinator from SRS within Energy Office to help with data and other tasks on agreed timescale. Estates and SRS to ensure clarification of roles and objectives in teams
Confusion of roles and responsibilities. Risk that many programme areas depending on shared responsibilities between Estates and SRS.	Possible	Moderate	 Chair of Utilities working group currently shared between Asst Director of Estates and Director of SRS. Clear role identification and application of project management.
Data availability	Possible	Moderate	 Projects coordinator from SRS seconded to Energy Office Nov to March 2016 to help with Data.

Lack of joined up strategic approach on financial savings and carbon savings	Possible	Moderate	 Development of revised Climate Strategy Internal cost of carbon factored in future development Evidence based: planning should make use of expertise around the university and targets will need to be stretching but realistic
Lack of buy in from around the University	Possible	Moderate	 Communicating the plan with clear messages from 'the top' on expectations Clarity on funding mechanisms for implementing spend to save projects, and information and reporting which connects day to day work with the bigger picture. Bringing the plan to life and engaging with staff and students across campuses on actions that can be taken, recognising that different strategies will be needed for different groups (energy coordinator network)

SITG 18/02/16	Draft Sustainable IT	Implementation F	Plan 2015-16	D
A. Evidence Building	Objective: To gather da understanding of the so footprint associated with boundary in line with th	ta to reach a broa cale of the Univers th IT, including ag he remit of the Gro	KPI: Number of areas/domains for which robust data has been produced and made available to SITG.	
Tasks	Colleagues Responsible	Colleagues to Consult	Dates	Outputs / Outcomes
A1. Agree SITG membership, remit and boundaries and define operational contr in terms of IT (personal computing, distributed network & data centres).	Jane Rooney	SITG	February 201	 6 Streamlined membership including student representation. Achievable, fully developed, agreed remit.
A2. Establish a baseline of sustainability metrics in relation to IT infrastructure (to understand how significant in carbon terms the various issues are) and feed in to development of an energy consumption tracking tool.	Dave Gorman & SRS	SITG	April 2016	Robust data on relative energy and carbon contribution including overall power consumption of equipment and whole life costing.
A3. Set realistic and measurable baseline an targets for carbon emissions associated with IT (taking account of anticipated growth) & agree reporting mechanism.	d Dave Gorman & SRS team with College reps?	SITG	April 2016	Agreed targets (relative or absolute?) and outline reporting structures through SITG to ITC & SRSC.
A4. Review the criteria (GHG Protocol or other) on carbon generated through shared services (e.g. ARCHER) and ensure noted in Carbon Scope documen circulated to members	SRS Dept Matthew Lawson t	SITG	April 2016	Agreed strategic approach & make recommendation to SRSC / ITC.

B. Pathways to energy efficiency improvements assessing the effectiveness and consequences of various opportunities to make energy, carbon and cost savings.			t	KPI: Number of projects identified and number of recommendations made for implementation (cost and carbon savings quantified where data is available).		
Tasks		Colleagues Responsible	Colleagues to Consult		Dates	Outputs / Outcomes
B1. Develop and distribute resources/materials to increase awareness of sustainability actions and promote best practice.		SRS Dept. Joe Farthing	SITG	July 2016		New electronic materials to promote energy efficiency in IT, including information on the relative impacts of different pieces of equipment to drive positive behaviours.
B2. Compile a body of evidence and case studies relating to utilities efficiency IT actions undertaken at other institutions.		SRS Dept.– Chris Litwiniuk	SITG Energy Office	Summer 2016		Summary report showing actions, payback periods and links to any publications.
B3. Develop networks and an event to share best	l potentially host practice.	Jane Rooney & Caro Overy	SITG Energy Office	By (201	October 6	Event delivered to UoE staff and staff from other universities / partner organisations.
B4. Publish case studies on website and distribute to key stakeholders		SRS Dept. – Joe Farthing	SITG	Throughout 2016, as they become available		Case studies of University of Edinburgh sustainable IT achievements published on website alongside messaging on positive impacts including investment work with corporate partners and effects the University has globally.
B5. Identify any funding o support sustainable IT	pportunities to projects	Michelle Brown & Claire Martin	SITG	Ong	going	An understanding of the funding landscape and communicating this to stakeholders. (e.g. ZWS PC reuse project currently underway)

B6. Investigate potential use of wireless to map use of devices and monitor usage levels as staff and student numbers increase.	IS representatives (Bryan MacGregor?)	SITG	April 2016	Scoping potential to report on use of devices and provide report then establish timelines for future reports
B7. Investigate intelligent power consumption agent software, e.g. to switch off machines out of office hours, which could generate significant savings.	IS representatives	SITG	April 2016	Recommendations on feasibility / pathways to implementation.
B8.Develop and promote an energy standby policy which could be implemented for supported desktops.	IS representatives with SRS Dept. promoting	SITG Energy Office	April 2016	Recommendations on feasibility / pathways to implementation.

C. Pathways to resource efficiency improvements	Objective: To identi improvement project assessing the effect various opportunitie	ify and enable I cts throughout t tiveness and co es to make reso	ty, number of projects identified and number of recommendations made for implementation (cost and carbon savings quantified where data is available).	
Tasks	Colleagues Responsible	Colleagues to Consult	Dates	Outputs / Outcomes
C1. Develop and distribute resources/materials to increase awareness of sustainability actions and promote best practice (including paperless working via One Drive).	SRS Dept. – Joe Farthing	SITG	Ongoing	New electronic materials to promote best practice in resource efficiency in IT to drive positive behaviours.
C2. Develop and disseminate sustainable procurement guidelines / minimum standards for IT and support SPPT prioritisation exercise.	George Reid / Procurement SRS Dept. – Chris Litwiniuk, Liz Cooper IS representatives	SITG	April 2016	All staff with IT procurement responsibilities have a list of sustainability criteria, which are then embedded into procurement process.
C3. Compile a body of evidence and case studies relating to resource efficiency IT actions undertaken at other institutions.	SRS Dept. – Caro Overy	SITG	Summer 2016	Summary report showing actions, savings, and links to any publications. (Work together with energy related case studies for efficiency).
C4. Develop networks and potentially host a circular economy event to share best practice and link with academics.	Michelle Brown, Liz Cooper & Caro Overy	SITG	By October 2016	Event delivered to UoE staff and staff from other universities / partner organisations.
C5. Publish case studies on website and distribute to key stakeholders	SRS – Joe Farthing	SITG	End July 2016	Case studies of University of Edinburgh sustainable IT achievements published on website alongside messaging on positive impacts including investment work with

				corporate partners and effects the University has globally.
C6. Conduct a pilot project monitoring PC cascading within CHSS.	SRS Dept. – Alan Peddie	SITG	April 2016	Summary report showing methodology and impacts.
C7. Investigate potential savings and risks associated with circular economy / resource efficiency / internal and external reuse; advise on and facilitate schemes (including packaging take-back schemes)	Fraser Muir & Alan Peddie	SITG	July 2016	Develop and deliver solutions to issues around secure data erasure, storage and time constraints to drive greater reuse. Make recommendations regarding the acquisition of a commercial product to cleanse PCs to a set standard.
C8. Map risks and opportunities through ICT value chains via the SPPT prioritisation exercise engaging with academics and researchers at UoE.	SRS Dept. – Liz Cooper Procurement – George Reid & Stuart McLean	SITG	April 2016	Risks and opportunities prioritized. Academics and student researchers engaged in process. Living Lab project linking academics and practitioners.

D. Contribution to wider SRS themes	Objective: Investigate SRS opportunities in IT beyond energy & waste			KPI: Number of papers endorsed / recommendations put forward
D1. Scanning and research risks and opportunities within UoE supply chains and link with wider partnerships (e.g. conflict minerals, Electronics Watch)	SRS Dept Liz Cooper & Chris Litwiniuk	SITG	October 2016	Papers / briefings endorsed by SITG and escalated via SRSC & ITC.
D2. Develop and promote the introduction of pilot schemes / opportunities around personal devices for staff to test internally.	SRS Dept.	SITG	July 2016	Schemes such as the addition of fair phones as an option for University telephony.

Sustainable IT Group 18/02/16



EAUC: GREEN ICT UPDATE

DECEMBER 2015

Latest Sustainable ICT News

Stratergia Papillon Update:

Papillon is a real time software solution that provides continuous energy monitoring and measurement at rack, server, virtual machine, application and Service levels, which has been developed by Stratergia. Stratergia has a reduced price offer for EAUC members and the offer of a free trial.

Based in Dublin, Stratergia was founded in 2011 by a team of industry experts seeking to create a new, better solution to the problem of data centre energy consumption spiralling out of control.

The details of the offer to EAUC members are at the end of this update.

Focus Group on Smart Sustainable Cities:

The ITU (which is a United Nations agency on ICT) has published a series of reports on Smart Sustainable Cities. The reports focus on the crucial role ICT has to play by increasing environmental efficiency across industry sectors and enabling such innovations as intelligent transport systems (ITS) and "smart" water, energy and waste management. The technical reports and specifications can be downloaded from:

http://www.itu.int/en/ITU-T/focusgroups/ssc/Pages/default.aspx

Key Sustainable ICT Documents

2015 Best Practice Guidelines for the EU Code of Conduct on Data Centres:

The latest version of the Code of Conduct for Data Centres was released in January 2015. It sets out the various requirements needed to meet the Code of Conduct.

The Code of Conduct is a good place to start for getting an overview of the areas involved in developing a comprehensive sustainability scheme for data centres. <u>http://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/files/COC_DC/2015_best_practice_guidelines_v6.1.1.pdf</u>

UK Government: Greening Government: ICT Strategy:

The Greening Government commitments ran from 2011 until 2015. For ICT the aim was to ensure that government will:

- Engage with its suppliers to reduce the impact of supply chains. Government will
- Strive to purchase sustainable, efficient products and services
- Proactively manage and reduce greenhouse gas emissions across government estates by 25% from a 09/10 baseline
- Ensure that redundant ICT is reused within government or the wider public sector whenever



practical and where not, is always responsibly recycled.

The full document can be downloaded from: <u>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/155098/greening-government-ict-strategy.pdf</u>

Scotland's Digital Future: Scottish Public Sector Green ICT Strategy:

The Scottish Green ICT Strategy was published in 2015 and aims to deliver "A cost effective and energy efficient ICT estate that reduces the environmental impact and continually looks at more sustainable ways of working for the public sector." The full document can be downloaded from:

http://www.gov.scot/Resource/0047/00474946.pdf

ICT Strategy for the Public Sector in Wales: The ICT Strategy includes several sections on the sustainable use of ICT systems. The document can be downloaded from: http://gov.wales/docs/det/publications/110525ictstrategy.pdf

Sustainability Exchange Resources:

Find more Green ICT resources on the Sustainability Exchange here: http://www.sustainabilityexchange.ac.uk/sustainable_ict_ http://www.eauc.org.uk/green_ict





DCD International Data Centre Industry Awards Finalist 2015

"30% of servers in enterprise data centres are useless" Stanford

University Rept, Center for Energy Policy and Finance, June 2015.

Our Papillon, data centre energy measurement and management technology, will identify them, quantify the savings and direct you to other energy-saving actions that will reduce your operating costs by 40%.

Special EAUC-member offer till February 2016

out-of-the Complete Papillon box Data Centre Energy Measurement and Management System:

Features:

- Fully Downloadable software solution. 98% accurate.
- > Operates on all server types (incl. Virtual machines) and operating systems.
- No cabling, retrofitting or downtime required.
- Papillon is the associated training environment for the free, On-line Green, Sustainable, Data Centre Management course of the Netherlands Open University.

System includes:

Papillon database for Asset/Inventory management, Energy/Power data storage, and Application, Virtual Machine, Service performance data.

Dashboards and Report tools :

Data centre configuration tool.	Asset management tool.
Server power modeller.	Real-time monitor.
Rack energy monitor.	Services Energy monitor.
Rack consolidation tool.	Energy-saving actions tool.
Energy Report tools.	Carbon-footprint calculator tool.
Audit and TCO tools.	Alarms and alerts.

Papillon API developer's toolkit.

Price: Special once-off perpetual licence/server. Immediate Payback only requires 1 redundant server in 300 to be detected (Papillon will also detect many other energy-saving actions).

Free 30-day trial available. More details on www.stratergia.com